Cal/Ecotox
Toxicity Data for Loggerhead Shrike (Lanius ludovicianus)*

Chemical	Tox Exposure	Endpoint Type	Endpoint Description	Endpoint Value	Note	Reference
AMMONIUM NITRATE	54 kg/ha application rate	TOX-Non-Repro-Sublethal - indirect effects	loss of eggs, nestlings, fledglings and adults post-spray vs. unsprayed controls	increased	a	1
AMMONIUM NITRATE	54 kg/ha application rate	TOX-Non-Repro-Sublethal - indirect effects	percent increase in breeding territory size post-spray vs. unsprayed controls	significantly increased (138.5% +/- 86.1 SD)	b	1
AMMONIUM NITRATE	54 kg/ha application rate	TOX-Non-Repro-Sublethal - indirect effects	timing of nesting season termination in pairs post-spray vs. unsprayed controls	significantly earlier	c	1
DDD (4,4'-); DDE (4,4'-); DDT (4,4'-)	0.22 kg DDT/ha	TOX-EXP IND - accumulation	concentrations of DDT, DDE, DDD (combined) in skin and brains, 2 years post-application	293.43-820.93 ppm, lipid weight	d	2
DDD (4,4'-); DDE (4,4'-); DDT (4,4'-)	0.22 kg DDT/ha	TOX-EXP IND - accumulation	figure showing concentration of DDT and metabolites in skin and brains before and after application	see figure	e	2
DDE (4,4'-)	21.04 (3.51 SE) ppm in fat of adult females	TOX-EXP IND - accumulation	concentration in eggs	3.09 (0.09 SE) ppm, wet wt	f	3
DDE (4,4'-)	21.04 (3.51 SE) ppm in fat of adult females	TOX-REPRO - physiology	eggshell thickness index compared with reference samples collected in 1875-95	decreased	g	3
DDE (4,4'-)	21.04 (3.51 SE) ppm in fat of adult females	TOX-REPRO - physiology	linear negative correlation of egg DDE concentration and shell thickness	y = 92.610 - 2.412 log x	h	3
DIELDRIN	0, 1, 2, 4, 8 mg/kg bw/d (87% active ingredient)	TOX-MORT - dose-response data	rate of mortality compared with controls	increased at 1, 2, 4, 8 mg/kg/d	i	4
DIELDRIN	0, 1 mg/kg bw/d (87% active ingredient)	TOX-Non-Repro-Sublethal - behavioral effects	latency to formation of natural prey killing behaviors	increased at 1 mg/kg	j	4

Notes

a Both Adult and Juv.; FL; B; Species - California (R)=Lanius ludovicianus; TOX - Chemical=6484-52-2; N=4 control, 8 treatment territories; June-July; MacArthur Agroecology Research Center, Archbold Biological Station; Tox Exp Tech=application to habitat; Tox Exp Dur=approx. 1 month; Tox Study Dur=approx. 1 month; Tox Stat Sig=NR

b Both Adult and Juv.; FL; B; Species - California (R)=Lanius ludovicianus; TOX - Chemical=6484-52-2; N=4 control, 8 treatment territories; June-July; MacArthur Agroecology Research Center, Archbold Biological Station; Tox Exp Tech=application to habitat; Tox Exp Dur=approx. 1 month; Tox Study Dur=approx. 1 month; Tox Stat Sig=Y; Total number of insects and insect species collected in sweepnets two weeks post-spray was lower than that in unsprayed pasture.

c Both Adult and Juv.; FL; B; Species - California (R)=Lanius ludovicianus; TOX - Chemical=6484-52-2; N=4 control, 8 treatment territories; June-July; MacArthur Agroecology Research Center, Archbold Biological Station; Tox Exp Tech=application to habitat; Tox Exp Dur=approx. 1 month; Tox Study Dur=approx. 1 month; Tox Stat Sig=Y

d NR; Yolo; CA; NR; Species - California (R)=Lanius ludovicianus; TOX - Chemical=72-54-8; TOX - Chemical=72-55-9; TOX - Chemical=50-29-3; N=2 birds; 3.2 km NE of Davis; Tox Exp Tech=experimental application; Tox Exp Dur=1 application; Tox Study Dur=2 yrs; Tox Stat Sig=NR

e NR; Yolo; CA; NR; Species - California (R)=Lanius ludovicianus; TOX - Chemical=72-54-8; TOX - Chemical=72-55-9; TOX - Chemical=50-29-3; N=27 birds (3-4/sampling time); 3.2 km NE of Davis; Tox Exp Tech=experimental application; Tox Exp Dur=1 application; Tox Study Dur=2 yrs; Tox Stat Sig=NR; See citation for residues in soil, vegetation, invertebrates, and mammals over time after application.

f Embryo; IL; NR; Species - California (R)=Lanius ludovicianus; TOX - Chemical=72-55-9; N=20 clutches, 104 eggs; Apr, May; southern IL; Tox Exp Dur=NR; Tox Exp Dur=parental transfer; Tox Study Dur=NR; Tox Stat Sig=NR; Egg and female shrike samples were collected independently, but within same geographic location.

g Embryo; IL; NR; Species - California (R)=Lanius ludovicianus; TOX - Chemical=72-55-9; N=20 clutches, 104 eggs; Apr, May; southern IL; Tox Exp Dur=parental transfer; Tox Exp Dur=NR; Tox Study Dur=NR; Tox Stat Sig=Y

h Embryo; IL; NR; Species - California (R)=Lanius ludovicianus; TOX - Chemical=72-55-9; N=20 clutches, 104 eggs; Apr, May; southern IL; Tox Exp Dur=parental transfer; Tox Exp Dur=NR; Tox Study Dur=NR; Tox Stat Sig=Y

i Juvenile; Lab; NR; Species - California (R)=Lanius ludovicianus; TOX - Chemical=60-57-1; TOX - Dose-Response Data Format=DR Table; N=10-11/dose; Age=1 day post-hatch (begin); collected in San Diego County, CA; Tox Exp Tech=gavage; Tox Exp Dur=until death (max. 103 d); Tox Study Dur=until death (max. 103 d); Tox Stat Sig=NR; See table in citation for mean ages at death for different doses (range 16.8 d @ 8 mg/kg/d to 84.5 d @ 1 mg/kg/d)

j Juvenile; Lab; NR; Species - California (R)=Lanius ludovicianus; TOX - Chemical=60-57-1; TOX - Dose-Response Data Format=DR Figure; TOX - Dose-Response Data Format=DR Table; N=10-11/dose; Age=1 day post-hatch (begin); collected in San Diego County, CA; Tox Exp Tech=gavage; Tox Exp Dur=until death (max. 103 d); Tox Study Dur=>55 d (behavioral testing); Tox Stat Sig=Y; See citation for table and figures showing timing of occurrence of various mouse killing behaviors.

References

1 Yosef, Reuven, and Mark A. Deyrup. 1998. Effects of fertilizer-induced reduction of invertebrates on reproductive success of loggerhead shrikes (Lanius ludovicianus). J. Zool. 139:307-312.

2 Rudd, R.L., R.B. Craig and W.S. Williams. 1981. Trophic accumulation of DDT in a terrestrial food web. Environ. Pollut. Ser. A. 25:219-228.
3 Anderson, William L., and Ronald E. Duzan. 1978. DDE residues and eggshell thinning in loggerhead shrikes. Wilson Bull. 90(2):215-220.
4 Busbee, Everette L. 1977. The effects of dieldrin on the behavior of young loggerhead shrikes. Auk. 94:28-35.